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EDITORIALS

Can We Predict the Therapeutic Effect of the New Radioactive Elements?

"CHILD flown across continent to get atomic treatment for leukemia—only to find deadly disease cannot be cured by radioactive bombardment," is the gist of a recent article by United Press. With a tremendous and quite logical public interest in atomic developments, we can perhaps expect that such incidents which have occurred with fair regularity in the past will now make headlines even oftener. It is indeed stirring to the imagination of layman and doctor alike to consider that some of the radioactive isotopes which can now be produced in relatively large quantities in the atomic pile may prove the cure to hitherto hopeless diseases.

Has our experience so far been sufficient that we can predict the course that such treatment will take and its outcome in some diseases? The answer is an unqualified "yes." It is now some ten years since radioactive phosphorus was synthesized in the cyclotron, and there has been a steady trickle of reports on the effect of radioactive isotopes in the treatment of leukemia and other malignant diseases ever since. Regarding the systemic effect of radioactive substances introduced intravenously or by mouth into the human being, we have known the answer for more than thirty years, for it was inevitable that investigators would try the effect of small doses of radium or radon on the entire organism, as well as apply relatively larger amounts to localized malignancies. Cameron[1] in 1915 classified the various methods of internal administration which ranged all the way from inhalation of radon containing steam to radium enemas. Then, as now, the idea seemed attractive that even a small dose of a substance with such concentrated power as radium might somehow produce a desirable effect.

The answer was not long in coming. Even if we had forgotten results of thirty years ago, the watch dial painters who pointed the tips of the radium-containing brushes with their lips gave an involuntary demonstration of the effect of radium poisoning in the early part of this decade.[4] Even earlier those of the gullible who responded to advertisements ballyhooing the beneficial effects of the waters from radioactive springs found out personally about radium poisoning the dangerous way.[2]

We have abundant information, therefore, to predict the systemic effects of radioactive substances introduced into the body.[5] As is always true with radiation therapy, there is a destructive effect which is differential in character depending upon the growth characteristics of the various cells. The most rapidly growing cells are the first to succumb to effect of radiation. The blood cells are particularly vulnerable, and experiments using Phosphorus 32 in the control of leukemia have been conducted with a degree of success for more than ten years.[3] Likewise, the "circulating tumors" of the blood stream which involve the red cells—polychythemia vera—respond to intravenous P-32. Edward H. Reinhard at the recent meeting of the American Association for the Advancement of Science, reports that P-32 in the treatment of polycythemia vera is "probably the best therapeutic agent at the present time."[7]

Working at the Philadelphia General Hospital, Widmann[6] recently reported a large series of leukemia patients treated by all the radiation methods now generally used. Whether he irradiated bone marrow or spleen or set the patient at a distance from the x-ray tube so that the entire organism could be "sprayed" he got the same result. In brief, there was no response in cases of acute leukemia, but the chronic cases responded by palliation of symptoms and a lengthening of life which Widmann adjudged to be about a year.

In a recent report to the American Radium Society and elsewhere, Dr. John Lawrence, who has worked for ten years with radioactive elements produced by the cyclotron, expressed the opinion that the therapeutic results were no better than those produced by x-ray.

It is entirely reasonable to conclude that in leukemia the new radioactive substances have nothing new to offer. Any type of radiation palliates chronic leukemia. No type seems to benefit in the acute cases.[5]

This does not mean that we cannot look forward to much of great scientific interest and possible therapeutic help from radioactive elements. Such isotopes, previously produced by the cyclotron in amounts detectable only by ultramicrochemistry, can now be expected from the atomic pile in sufficient quantity to render them available for medical experimentation. Radioactive phosphorus is concentrated in organs with a high phosphorus content such as bone, but experiments in the control of osteogenic sarcoma have been disappointing, because it has not been possible to reach a sufficiently high concentration in the tumor area. Radioactive iodine is concentrated in the thyroid, and early experiments show it may be very useful in the control of hyperthyroidism, or even sometimes in the control of thyroid carcinoma.

P-32 has a half life of 14.3 days—a fact which may make it much more useful than radon, which is customarily used for implantation in gold seeds, and which has a half life of a little less than 4 days. Low-Beer[8] has recently used blotting paper moistened by P-32 to cure surface malignancies.

There are numerous interesting possibilities for the use of radioactive isotopes, many yet unexplored. We can predict with reason and from more than ten years' experience, however, that there will be no advantage in the use of these substances over the commonly used types of radiation in the treatment of leukemia.

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FREEDOM FROM DOUBT

When the California State Supreme Court late last month issued its decision in the California Physicians' Service case it removed whatever doubt had previously existed as to the exact corporate structure and status of C.P.S. Litigation lasting more than six years was concluded and the doctors behind the program were given a green light to proceed under their original plans.

Behind this case was the desire of C.P.S. to prove itself a service organization, incorporated not for profit but for the good that could be delivered to the people of California. The original suit was filed in Superior Court by C.P.S., asking that the court declare C.P.S. not an insurance operation. The Superior Court agreed with the reasoning behind this suit and enjoined the state Insurance Commissioner from assuming jurisdiction over C.P.S.

On appeal from this decision by the Insurance Commissioner, the Appeal Court upheld the Superior Court; on appeal from that decision, the matter went before the Supreme Court.

On another page of this issue will be found a digest of the Supreme Court decision; it makes extremely interesting reading. For the benefit of those who do not wish to go over the entire digest, it is noteworthy that the Court looked upon C.P.S. from the human side and not merely from the business angle. The decision says: "Probably there is no more impelling need than that of adequate medical care on a voluntary, low-cost basis. The medical profession, unitedly, is endeavoring to meet that need. Unquestionably this is a service of a high order and not indemnity."

In another place the Court characterizes C.P.S. as "a pioneer attempt by the physicians of California to make available medical care for those who find the cost of sickness a burden not easy to bear."

One result of this opinion is that there need now be no question about imposing on the people of California a gross premiums tax which would be levied against them if C.P.S. were held to be an insurance operation. Thus a tax on human suffering need not be levied. Another result is that the many corporations and business organizations which have been hesitant to enroll their employees in C.P.S. because of a possible cloud on the status of the service may now go ahead and bring the benefits of a high grade non-profit medical care service to their workers.

As for the doctors—and more than 7,400 of them are now physician members of C.P.S.—the most significant interpretation of this decision is the removal of doubt which has shadowed C.P.S. for six years. Wherever hesitancy may have existed before, it may now be dropped;